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3. $\frac{4}{2}+10$ minutes=distance from 4 to minute hand, since hour-hand is half way between 4 and the minute-hand.

4. $\frac{4}{2}+30$ minutes=distance from 12 to minute hand.

5. $\therefore$ $\frac{24}{2}=\frac{4}{2}+30$ minutes.

6. $\therefore$ $\frac{20}{2}=30$ minutes.

7. $\frac{1}{2}=\frac{1}{20}$ of 30 minutes$=1\frac{1}{2}$ minutes.

8. $\frac{24}{2}=24$ times $1\frac{1}{2}$ minutes=36 minutes=time past 5.

IV. Solution by Hon. **JOSIAH H. DRUMMOND**, Portland, Me.; **ALOIS F. KOVARIK**, Instructor in Mathematics and Science, Decorah Institute, Decorah, Ia.; **W. MANZILLA**, Instructor in Mathematics, Langston University, Langston, Okla., and **JOHN M. COLAW**, A. M., Monterey, Va.

As the minute-hand travels over twelve minute-spaces while the hour-hand is going over one, the distance from XII to the hour-hand is $25+\frac{1}{12}$ of the distance the minute-hand travels; and one-half of this is $\frac{25}{2}+\frac{1}{24}$ of that distance.

Hence, $\frac{25}{2}$ is $\frac{23}{24}$ of that distance which is $13\frac{1}{23}$, and the time is $13\frac{1}{23}$ minutes past five.

Second. Of course at two o'clock the hour-hand is precisely half-way between IV and the minute-hand.

Again, while the minute-hand travels from XII to IV, the hour-hand goes over $\frac{20}{12}$ minute-spaces. Hence $\frac{20}{12}+\frac{1}{12}$ of the distance the minute-hand travels after it reaches IV=one-half of that distance.

Hence $\frac{20}{12}$ is $\frac{5}{12}$ of that distance which is four. And the time required is twenty-four minutes past four.

ALGEBRA.

99. Proposed by **CHARLES HALLETTE JUDSON**, Professor of Mathematics, Furman University, Greenville, S. C.

Seven persons met at a summer resort, and agreed to remain as many days as there are ways of sitting at a round table, so that no one shall sit twice between the same two companions. They remained fifteen days. It is required to show in what way they may have been seated.

I. Solution by **P. H. PHILBRICK**, C. E., Chief Engineer for Kansas City, Watkins & Gulf Railway Co., Lake Charles, La.

Each person has six companions; and the the number of ways of sitting are, therefore, equal to the number of ways of selecting two out of six or $6.5/1.2=15$ ways.

II. Solution by the **PROPOSER**.

I give below the seating of 6 persons 10 ways, and of 8 persons 21 ways, but I have failed to get a correct seating of 7.

n persons can be seated in $\frac{(n-1)(n-2)}{2}$ ways.

1	A^1	B^2	C^3	D^4	E^5	F^6
2	A^1	B^2	D^4	C^3	F^6	E^5
3	A^1	B^2	E^5	F^6	D^4	C^3
4	A^1	B^2	F^6	E^5	C^3	D^4
5	A	C	F	D	B	E
6	A	C	E	B	F	D
7	A	C	B	E	D	F
8	A	D	E	C	B	F
9	A	D	B	F	C	E
10	A	E	D	B	C	F

1	A	B	C	D	E	F	G	H
2	A	B	D	F	G	C	H	E
3	A	B	E	G	F	H	C	D
4	A	B	F	C	H	D	E	G
5	A	B	G	H	C	E	D	F
6	A	B	H	E	D	G	F	C
7	A	C	G	E	H	F	B	D
8	A	C	D	H	E	B	F	G
9	A	C	E	F	B	G	D	H
10	A	C	H	B	F	D	G	E
11	A	C	B	D	G	H	E	F
12	A	D	H	G	E	C	B	F
13	A	D	F	E	G	B	C	H
14	A	D	G	C	B	H	F	E
15	A	D	E	B	C	F	H	G
16	A	E	C	F	D	H	B	G
17	A	E	D	B	H	G	C	F
18	A	E	B	G	C	D	F	H
19	A	F	H	D	B	E	C	G
20	A	F	G	B	D	C	E	H
21	A	G	D	C	F	E	B	H

In seating the 8 persons, the first six arrangements are quite simple, as indicated. Now take 6 reversed, and permute them just as the first 6. This gives the next 5. Take any other, as 3, reversed, and permute in same way. Take 4 in same way rejecting first 1, then 2, then 3, then 4, which have been previously arranged, and we finally get 21.

[Neither of the above solutions show *how* to seat 7 persons in the 15 ways. For the first correct arrangement sent us, we are authorized to offer a year's subscription to the MONTHLY. EDITOR.]

100. Proposed by W. H. CARTER, Vice President, and Professor of Mathemetics, Centenary College, Jackson, La.

Solve, $x^{x-y}=y^{4a}$, $y^{x+y}=x^{a}$.

I. Solution by CHARLES C. CROSS, Meredithville, Va.; P. S. BERG, A. M., Larimore, N. D.; J. D. CRAIG, Frankfort, N. J.; JOSIAH H. DRUMMOND, LL. D., Portland, Me.; ALOIS F. KOVARIK, Decorah, Ia.; P. H. PHILBRICK, C. E., Lake Charles, La.; and COOPER D. SCHMITT, A. M., Knoxville, Tenn.

Taking logarithms, we have, $(x+y)\log x=4a\log y$......(1);

and $(x+y)\log y=a\log x$ .....(2).

(1) divided by (2) gives $\log^2 x=4\log^2 y$,

or $\log x=2\log y$......(3);